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ABSTRACT

The 1994 Florida State Legislature directed the Postsecondary Education Planning Commission to conduct a review of selected Associate in Science (A.S.) community college programs to determine the effect of program length on student completion rates, licensure passing rates, job placements, average earnings, and performance in further postsecondary education. The Commission selected 14 programs that displayed the largest variance in semester credit hours (SCHs), were limited access programs, and/or were identified by the Florida Chamber of Commerce as those leading to "Top Jobs in Florida," Although a statistical analysis was not conducted on students enrolled in Associate in Arts (A.A.) programs, the Commission found that the length of A.A. degrees has expanded beyond the traditional 60 semester credit hours (SCHs) at every community college except three. General education (GE) requirements at many colleges have also expanded beyond the minimum 36 SCH mandated. Based on statistical data analysis of the AS programs, it does not appear that program length has a significant effect on any of the specified student outcomes. Based on study findings, the Commission recommended that the number of student credit hours in A.A. degree programs be limited to 60 SCHs, and that the A.S. degree should be awarded upon satisfactory completion of not less than 60 college credits including 18 hours of general education requirements. (KP)

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COMMUNITY COLLEGE PROGRAM LENGTH

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Report and Recommendations of the Florida Postsecondary Education Planning Commission

JC 950 184

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1994 - Report 3

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The Postsecondary Education Planning Commission, initially created by executive order in 1980, given statutory authority in 1981 (SS 240.145 and 240.147, Florida Statutes), and reauthorized by the 1991 Legislature, serves as a citizen board to coordinate the efforts of postsecondary institutions and provide independent policy analyses and recommendations to the State Board of Education and the Legislature. The Commission is composed of 11 members of the general public and one full-time student registered at a postsecondary education institution in Florida. Members are appointed by the Governor with the approval of three members of the State Board of Education and subject to confirmation by the Senate.

The major responsibility of the Commission is preparing and updating every five years a master plan for postsecondary education. The enabling legislation provides that the Plan "shall include consideration of the promotion of quality, fundamental educational goals, programmatic access, needs for remedial education, regional and state economic development, international education programs, demographic patterns, student demand for programs, needs of particular subgroups of the population, implementation of innovative educational techniques and technology, and the requirements of the labor market. The capacity of existing programs, in both public and independent institutions, to respond to identified needs shall be evaluated and a plan shall be developed to respond efficiently to unmet needs."

Other responsibilities include recommending to the State Board of Education program contracts with independent institutions; advising the State Board regarding the need for and location of new programs, branch campuses and centers of public postsecondary education institutions; periodically reviewing the accountability processes and reports of the public and independent postsecondary sectors; reviewing public postsecondary education budget requests for compliance with the State Master Plan; and periodically conducting special studies, analyses, and evaluations related to specific postsecondary education issues and programs.

Further information about the Commission, its publications, meetings and other activities may be obtained from the Commission office, 231 Collins Building, Department of Education, Tallahassee, Florida, 32399-0400; telephone (904) 488-7894; FAX (904) 922-5388.

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POSTSECONDARY EDUCATION PLANNING COMMISSION

COMMUNITY COLLEGE

PROGRAM LENGTH

Prepared in Response to Specific
Appropriation 573
of the
1994 Appropriations Act

1995 - Report 3

January, 1995

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EXECUTIVE SUMMARY

The 1994 Legislature directed the Postsecondary Education Planning Commission to conduct a review of selected Associate in Science (A.S.) community college programs to determine the effect of program length on student completion rates, licensure passing rates, job placements, average earnings, and performance in further postsecondary education. This study grew out of legislative concern over the expansion of degree programs at both the associate and baccalaureate levels. "Time to degree" has a fiscal impact on both the state and student. It is also an articulation issue for students transferring to the State University System (SUS). Consequently, the Commission elected to broaden its analysis to include the Associate in Arts (A.A.) degree as well.

To conduct an analysis of the A.S. degree programs, the Commission selected fourteen programs that displayed the largest variance in semester credit hours, were limited access programs, and/or were identified by the Florida Chamber of Commerce as those leading to "Top Jobs in Florida." An attempt was made to include large and small programs from a cross-section of occupational fields. The Commission received student data on those programs from the Florida Educational Training and Placement Information Program (FETPIP), the State Board of Community Colleges (SBCC) and various state regulatory agencies. A consultant was hired to conduct a statistical analysis of the data to measure the influence of program length on specific student outcomes. In addition, the Commission followed the ongoing work of the SBCC's Committee of Instructional Affairs and Presidents' Task Force on Articulation, both of which are reviewing program degree length. Recommendations from those committees will be made to the SBCC in early 1995.

Although a statistical analysis was not conducted on students enrolled in A.A. programs, the Commission found that the length of A.A. degrees has expanded beyond the traditional 60 semester credit hours (SCHS) at every community college except for three. General education requirements have also expanded at many colleges beyond the minimum 36 SCHS mandated in state statute. In addition, some colleges require students to take courses that not only expand the A.A. degree, but are not transferable to the SUS system. At the same time, baccalaureate programs have also expanded beyond 120 SCHs in recent years. The Board of Regents has established a range of 120-128 for most BA/BS degree programs. It is clear that program length is an important articulation issue.

Based on the statistical data analysis of the A.S. programs, it does not appear that program length has a significant effect on any of the specified student outcomes. A sizable majority of all relationships examined were not statistically significant and those that were seem to be split rather evenly between positive and negative effects. The only possible exception to this would be the effect of program length on completion. Statewide, the relationship between program length and completion was significant for 64 percent of the cases. When the statistical analyses were repeated for separate regions of the state, the significance of program length decreased for all outcomes. In summary, the Commission's analysis did not support the conclusion that program length had a significant affect on the student outcomes identified. It would appear that other factors are more likely the predictors of student outcomes. The hypothesis that a longer program is beneficial to the student because it may contain more opportunities for training or learning is not

supported by the present data. Therefore, the following recommendations regarding associate degree program length are:

Recommendations:

1. State Board of Education Rule 6A-14.030 (1) should be amended to require that the associate in arts (A.A.) degree be awarded upon satisfactory completion of a planned program of ~~at least~~ sixty (60) college credits, exclusive of courses not accepted in the State University System, after the demonstration of the attainment of predetermined and specified performance requirements.

2. State Board Education Rule 6A-10.024 (5) (a) should be amended to require that the A.A. degree be awarded upon satisfactory completion of ~~at least~~ sixty (60) semester hours of college credit exclusive of courses not accepted in the state university system, and including a general education core curriculum of ~~at least~~ thirty-six (36) semester hours of college credit in the liberal arts and sciences. Section 240.239 (3) should be amended similarly.

3. The Commission believes that limiting the number of student credit hours in associate degree programs should not prevent a student from choosing to take additional courses necessary for a bachelor's degree program or career preparation. *For example, a student enrolling in a community college may be placed into mathematics or science courses that are at a lower level than those identified as the first course in sequence identified for a specific major. To meet all prerequisites for enrolling in a university, the student may need to take additional hours of coursework which exceeds the requirements for the associate degree.*

4. State Board of Education Rule 6A-14.030 (2) should be amended to require the associate in science (A.S.) degree be awarded upon satisfactory completion of a planned program of not less than sixty (60) college credits which include 18 semester credit hours of general education requirements.

5. The State Board of Community Colleges should establish in rule a standard program length for each associate in science program. The number of required credit hours should not exceed the minimum number of hours necessary to prepare the student for job entry.

6. The process of reviewing compliance with the A.S. program length standards should become part of the Community College Accountability Plan. Thus, Section 240.324 (1) F.S. should be amended to include (g) Length of time and number of academic credits required to complete an Associate of Science degree by institution and by degree. To implement this requirement, the State Board of Community Colleges and the Florida Education and Training Placement Program (FETPIP) should work together to compile and analyze three years of student outcome data (1992-95) to further determine the effects of A.S. program length on selected student outcomes.

I. INTRODUCTION

In Proviso language accompanying Specific Appropriation 573 of the 1994 Appropriations Act, the 1994 Legislature directed the Postsecondary Education Planning Commission to conduct a review of selected community college programs statewide and analyze the relationship between program length and certain student outcomes. Specifically, the Legislature requested that the Commission address any links between program length and completion rates, licensure passing rates, job placements, average earnings, and performance in further postsecondary education. In addition, the Commission also reviewed the length of the Associate in Arts (A.A.) program to determine if programs in excess of 60 hours were justified and if, or how, those additional hours impacted articulation. The community college program review was assigned to the Program Committee by the Commission Chairman. Members of the Program Committee included Ms. Inez Bailey, Chairperson, Dr. Richard Alterman, Ms. Sally Gillespie, Dr. Thomas Haynes and Mr. Ramiro Inguanzo.

The length of academic programs at the associate and baccalaureate levels has been an issue in higher education in Florida for the last several years. Because the number of degree credits has increased beyond the traditional 60 Semester Credit Hours (SCHs) for many associate programs and 120 SCHs for many baccalaureate programs, the time taken to complete those degrees has also increased. Consequently, "time to degree" has a fiscal impact on both the state and student. This is true for community college students who immediately seek employment or who transfer to the State University System (SUS).

To conduct an analysis of the Associate in Science (A.S.) degree programs, the Commission selected fourteen programs that displayed the largest variance in semester credit hours, were limited access programs, and/or were identified by the Florida Chamber of Commerce as those leading to "Top Jobs in Florida." An attempt was made to include large and small programs from a cross-section of occupational fields. Follow-up data on the students completing or leaving these programs for 1991-92 were obtained from Florida Education and Training Placement Information Program (FETPIP), the Department of Professional Regulation, and the Health Care Administration Program. A consultant was hired by the Commission to conduct a statistical analysis of the data to measure the influence of program length on specific student outcomes. The consultant also measured the effect of geographic location on those outcomes. The methodology and results of those analyses are detailed in Chapter II and in Appendices A and B.

To understand why program length might vary from college to college, the Commission examined several programs to learn if program expansion is justified by the particular employment needs of a community or special accreditation standards of a professional board. A review of the curriculum of like programs was also reviewed to determine if the manner in which credit was assigned to certain classwork, apprenticeships or laboratory requirements explained a SCH disparity among colleges. While Commission staff collected data for this study, the State Board of Community Colleges' Committee of Instructional Affairs and Presidents' Task Force on Articulation also investigated the issue of A.S. program length and made recommendations for changes in that area. Those preliminary recommendations are included in Chapter II. In addition, the Senate Appropriations Committee staff is conducting a study on several articulation issues related to the

Associate in Arts degree. The results of that study will be available in March 1995. To facilitate a thorough review of community college program length, the Commission held six public meetings and solicited the written and oral comments and suggestions of interested parties. The Committee will present a final report to the Commission on January 26, for action and transmittal to the Legislature and State Board of Education by January 31, 1995.

II. COMMUNITY COLLEGE PROGRAM LENGTH

Background

Over 279,000 degree seeking students were enrolled in one of the state's 28 community colleges in 1990-91. That year (the most recent year follow-up data are available), 72 percent (200,874 students) were enrolled in Associate in Arts (A.A.) programs, 20 percent (54,931 students) were enrolled in Associate in Science (A.S.) programs, and eight percent (23,810 students) were in college credit certificate programs. Of the thirty-seven thousand awards earned by community college graduates that year, 60 percent (22,265) were A.A. degrees, 18 percent (6,672) were A.S. degrees and 22 percent (8,151) were certificates.

To receive an A.A. or A.S. degree within the community college system, students must complete a minimum of 60 semester credit hours (SBE Rule 6A-14. 030). The A.A., designed to be the "transfer" degree to the university system, must contain at least 36 hours of general education course requirements (Section 240.239 (3) F.S.; SBE Rule 6A-10.024 (5) (a)). Over the years, for a variety of reasons, the number of credit hours required to earn an A.A. has expanded at most colleges beyond the traditional 60-hours or two-year period. The A.S. degree, designed to be a technical, career-oriented degree, has also expanded beyond 60 SCHs. Because the A.S. degree is more closely tied to community rather than statewide needs, some programs have been expanded to meet the demand of local employers. Others were lengthened because of specialized accreditation criteria. However, many programs, particularly in the health fields, are subject to state licensure and course guidelines geared to produce students with common, statewide proficiencies. Thus, those programs should follow a more standard curriculum. Although there is nothing in statute or rule specifying how many general education requirements are required in A.S. programs, SACS (Southern Association of Colleges and Schools) requires that each A.S. degree program contain a minimum of 15 SCHs of general education requirements. There is no cap or range defined for the number of overall credit hours required to earn an A.S. Consequently, the number of credit hours required varies from program to program and community college to community college. Among the colleges, the general education requirements vary from 15 to 26 SCHs depending on the program.

Associate in Arts Degree

For the last year, the State Board of Community Colleges (SBCC) has been reviewing the lengths of its A.A. degree programs to decide if a policy or rule establishing a standard SCH range is needed throughout the system. As part of its review process, the SBCC found that the A.A. was awarded at only three colleges once 60 SCHs were reached, eight at 62 SCHs, 15 at 64 SCHs, one at 65 SCHs and one at 67 SCHs. Noting this disparity, the 1994 Legislature directed the SBCC to amend its rules to specify that, beginning with Fall Term 1995, no community college may require more than sixty semester hours of college credit to receive an Associate in Arts degree. In addition, all the credits must be acceptable in transfer to the State University System. Because this requirement was contained in the proviso language of the appropriations bill, it would need to be reenacted by the 1995 Legislature or written into statute before it could take effect.

To determine the minimum and maximum amount of SCHs required by colleges in other states, the Commission surveyed State Higher Education Executive Officers (SHEEO). Sixteen states replied. Only three of the responding states set a maximum number of hours required for the A.A., all but two set a minimum hourly requirement. The average length required for an A.A. was approximately 64 SCHs. General education requirements varied from a low of 18 to a high of 50.

Associate in Science Degree

Systemwide, there are 104 A.S. degree programs offered within the community college system. Collectively, the community colleges offer over 700 of these programs. Most of them exceed 60 SCHs. The majority (575) however, are under 70 credit hours while 159 programs range from 71-102 SCH. One program is offered at 120 SCH. In the Fall of 1993, the SBCC's Articulation Committee of the Council of Presidents and the Council on Instructional Affairs began to analyze the credit hour disparity for A.S. programs. Both groups agreed that all A.S. programs should reflect the lowest number of credit hours required for a student to meet the entry level employment requirements in the field. Committees organized by discipline clusters were established to recommend a standard SCH requirement for each program that includes 18 SCHs of general education requirements. If their recommendation for a particular program exceeded 64 credit hours, or if the program length was greater than the lowest credit hour length at which it was offered at any school, then such variation had to be sufficiently justified to the Council of Presidents. There are still a number of programs for which the discipline committees have not yet reached a consensus recommendation. However, when the process is completed (January, 1995) the SBCC plans to establish a standard A.S. degree length for each separate program in rule.

State University System

Although not the focus of this study, program length at the university level is related to both A.A. and A.S. community college programs. The Board of Regents and the Legislature have been reviewing baccalaureate programs length for some time. After an initial inventory revealed that a number of SUS undergraduate programs exceeded the 120 SCH range, the BOR established a range for most BA/BS degree programs of 120-128 semester credit hours. Eighty-one percent of the baccalaureate programs now fall within that range. Exceptions were granted for four percent that exceed the range. Most of those programs are in the visual and performing arts. The remaining programs (15%) that exceed the range are being analyzed as part of the BOR's program review process. In addition, as part of its annual accountability plan, the BOR requires each university to annually report the number of academic credits required to complete each degree program. Exceptions to the 120-128 SCH range must be approved by the BOR. However, as is true at the community college level, program length varies by university. For example, all engineering programs are not offered at the same SCH requirement throughout the system.

Factors Affecting Program Length

Associate in Arts Degree

Semester credit hour expansion in A.A. programs has generally been within the area of general education requirements. Currently there are no maximum SCHs prescribed in rule or statute for general education courses leading to an A.A. degree. Consequently, general education requirements vary from a low of 36 SCHs at Valencia Community College to a high of 47 SCHs at Daytona Beach Community College. Because there is a growing need for students to be more proficient in the areas of communication, mathematics, and technology, some community colleges now require a more rigorous and longer general education curriculum. Other colleges may require students to take a number of courses (computer information, ethics, physical education) that not only expand the A.A. degree, but are not transferable to the SUS system.

Related to the issue of program length at the A.A. level is whether students who transfer from community colleges are required to retake courses at the university level because of inconsistencies in course numbering or because individual academic departments will not accept certain courses taken at the lower level. The Senate Appropriations Committee is currently reviewing articulation issues related to the A.A. degree. Their results will be available after this study is completed.

Associate in Science Degree

The A.S. degree in Florida was designed to be a technical, career-oriented award that prepares students to meet entry level employment requirements. In general, A.S. programs were designed to respond to local, not statewide, industry needs. Consequently, colleges were given the latitude to develop program curricula with input from local industry councils and professional accrediting and licensing boards. Thus, not all program requirements are consistent across the state. For instance, the A.S. nursing program at Broward Community College consists of 80 SCHs and requires students to complete 1,008 clinical hours and 45 nursing credits. The same nursing program at Tallahassee Community College consists of 69 SCHs and requires students to complete 493 clinical hours and 35 nursing credits. Both programs are approved by the state licensing board and graduates must pass a standardized licensure exam to practice in the state. The Broward program is accredited by the National League for Nurses (N.L.N.), which recommends that the length of A.S. programs be set at 72 SCHs. The Tallahassee program is not accredited by the N.L.N.

The two nursing programs are illustrative of another factor affecting disparities in program length: the lack of standardized clinical hours. In those programs where students spend a good deal of time in supervised clinical work, the ratio of clinic hours to credit hours affects program length and tuition revenues. For instance, a student in a program with a credit-to-clinic ratio of 2:1 would be in a longer course and pay more money than a student in a program with a ratio of 3:1.

As is true with the A.A. programs, the general education requirements vary between and among A.S. degree programs. SACS requires that A.S. programs contain a minimum of 15 SCHs of general education requirements. Generally, as programs expand, so do general education courses, although this is not always the case. Some programs have limited their general education requirements to the traditional 15 credits and expanded their

professional or elective requirements. In some instances, particularly in programs where students plan to transfer, courses have been added to the curricula without restructuring or removing obsolete training or coursework.

Technological advances and computer literacy requirements are two important factors that have affected A.S. program length. This is particularly true of programs in health related fields as well as in the areas of electronic, electrical, environmental and computer technologies. Some programs are pressed to include additional courses and training to adequately prepare students for the workplace. Others have added requirements to meet the criteria established by a national accrediting board. Still others have designed their A.S. programs to meet the specifications of a particular local employer. Some colleges have considered awarding postsecondary vocational credits to students enrolled in A.S. Programs that exceed 60 SCHs. Others want to develop a technical certificate as a "post" A.S. degree award. In other words, an A.S. nursing student could earn a technical certificate in pediatrics.

Credit hour disparities also occur when students who have completed a certificate level or industry certification program enroll in an A.S. program in the same occupational area. Colleges vary as to the amount of certificate or work experience credit they will accept into their A.S. programs. Thus, some programs (particularly in the technology fields) are longer at the colleges that require all credit to be taken within the A.S. program.

As previously mentioned, one of the primary sources of variance in A.S. program length is among general education requirements. Yet a "catalogue" review of a variety of different programs reveals that among programs with a wide range of SCHs, the greatest disparity appears to be in the core curriculum. The Court Reporting Program is a good example of a program with a wide range of SCHs at different colleges. For example, at Daytona Beach Community College the program is 87 SCHs long. At Pensacola Jr. College it is 65 hours long. Both programs require 15 SCHs of general education courses. The Daytona curricula includes two additional SCHs in health and fitness, three extra SCHs in an elective, and 17 extra SCHS in the core professional courses (Machine Shorthand IV and V).

Commission Data Analysis

To determine if there was a significant relationship between program length and certain student outcomes (completion rates, related employment, continuing education, wages, and licensure), Commission staff selected 14 A.S. programs with a wide range of SCHs for analysis. Half of the programs were limited access programs or designated by the Florida Chamber of Commerce as leading to a "top career" in Florida (Table 1). Follow-up data on 9,500 student records for the year 1991-92 were provided by the Florida Education and Training Placement Information Program (FETPIP). In addition, the Florida Board of Nursing and the Department of Professional Regulation (DPR) provided licensure passage information on three programs-- Nursing (RN), Dental Hygiene, and Respiratory Therapy. Licensure information was available only by college and not by individual student record. Therefore it was analyzed and reported separately. A consultant was retained to analyze the FETPIP student level data by program and by college. Results were first tabulated statewide and then by the five distinct planning regions of the state established by the Department of Vocational, Adult and Community Education.

All outcome analyses were conducted using the chi-square test of statistical significance on cross-tabulations (crosstabs). For a description of the methods of analysis see Appendix B.

The results of the statewide analysis of program length revealed that, in general, program length does not have a significant effect on the four outcome variables examined. Sixty-two percent of all relationships examined were not statistically significant, and those that were (38%) seemed to be split rather evenly between positive (23%) and negative (15%) effects. The only exception to this was the effect of program length on completion.

In the overall analysis, the relationship between program length and completion was significant for nine of the programs, positive in seven programs and negative in two (Table 2). Thus the longer the program, the more likely the student was to complete (graduate) in the following areas: Air Conditioning, Refrigeration and Heating Systems Technology, Computer Engineering Technology, Dental Hygiene, Emergency Medical Services, Photographic Technician, Professional Pilot, and Radiography. The longer the program, the less likely the students were to complete in the Electronics Engineering and Legal Assistant programs. In the five remaining programs, the effect of program length was non-significant.

Table 3 shows the percentage of students completing programs of above and below average lengths (programs were divided at the mean). Dental Hygiene illustrates the positive effects of program length for students enrolled in that program. Seventy-six percent of the students enrolled in above average length programs graduated, compared to 62 percent of the students who enrolled in the below average length programs. Conversely, the Legal Assisting Program illustrates the negative effects of program length for students enrolled in the program. Twenty-six percent of the students enrolled in below average length programs graduated, while 21 percent of students enrolled in above average length programs completed. Table 7 provides average program length for each program statewide and by region.

The effects of program length on job related employment were analyzed for program completers only. FETPIP does not compile data on related employment for program leavers. Program length had a positive relationship on a student finding a job in a training related field in two programs, Electronics Technology and Legal Assistant (Table 4). Conversely, the longer a program the less likely a student was to find related employment in the fields of Radiography and Emergency Medical Services.

Of the four student outcomes examined, program length had the least impact on continuing education (Table 5). In eleven of the fourteen programs analyzed, length of program did not have a statistically significant effect on continuing education. In Emergency Medical Services, Nursing and Radiography, program length had a statistically significant negative effect on continuing education.

Only the wages of employed program completers were included when assessing the effects of program length on income (Table 6). In three programs--Electronics Engineering, Legal Assistant and Nursing--program length had a positive effect on income. That is, in those fields of training, as program length increases, participants' wages also increase. The opposite effect was true in Emergency Medical Services. For the

majority of the programs (ten), program length was not a good predictor of wages.

To determine if program length's impact on the four outcomes varied by region, colleges were divided into five separate planning regions (Table 8). All statistical analyses were then repeated holding region constant (Table 9). In many of the regional analyses there was a small number of cases involved, especially when only completers and employed completers were included. This makes the crosstabs difficult to interpret because the addition (or subtraction) of only a few cases can change the results dramatically. This also makes the calculation of percentages less meaningful. In addition, not all programs are offered in each region, and within some regions the programs are the same length so a comparison could not be made. Therefore, although there is valuable information in the regional analysis, particularly for local policy makers, those data should be considered somewhat tenuous, and more weight should be placed on the overall analyses. In general, the regional analysis as well as the statewide analysis established that program length did not have a significant overall impact on the four student outcomes (Table 12).

Finally, a regression analysis was conducted on three programs where the statewide analysis had revealed a positive relationship between program length and income. Geographic location was combined with program length as a predictor variable (Table 10). Because the wages in region 5 (Dade, Broward, Monroe and Palm Beach Counties) were higher across the board (Table 11), that region served as a reference or comparison region. For the Electronics Engineering program, the analysis revealed that neither region nor program length had a significant effect on income. For the Legal Assisting Program, length was not significant and there was a variation in income explained by regional differences. For example, the lower incomes paid to Legal Assistants in Regions 1, 3 and 4 can better be explained by regional differences, rather than the length of the program. The same is true for Nursing. Differences in income are better explained by regional differences than by program length. However, since the proportion of variance in income explained by a model including only program length and geographic region is less than ten percent, these results should be treated with caution.

Licensure Passage Rates

Passage rates were compiled for the three largest programs that require students to be licensed to practice in their profession. Programs included were Nursing (RN), Dental Hygiene and Respiratory Therapy. As with the other student outcomes, program length does not appear to be a good prediction of licensure passage rates (Charts 1, 2, 3). Passing rates are uniformly high and there does not seem to be any distinct pattern to passage rate by program length. Given the widely varying and often small numbers of student taking the exams, the passage rates could be as much a function of the number of people taking the test as they are of program length.

Interpretation of Results

Based on the analysis it does not appear that program length has a significant effect on any of the four outcome variables examined. A sizable majority of all relationships examined were not statistically significant and those that were seem to be split rather evenly between positive and negative effects. The only possible exception to this would be the effect of program length on completion. In the overall analysis this relationship was positive

and significant for seven of the 14 programs examined, compared to five non-significant effects and only two significant negative effects, indicating that longer programs would increase the probability of completion. However, in the regional analysis, more relationships were non-significant than either positive or negative, and there were actually more negative effects than positive. Results of the regression analyses support the conclusion that program length does not have an effect on income. However, keeping in mind that more weight should be given to the overall analysis, it may be that program length does in fact have a positive impact on completion. Overall, it seems that the effects of program length on the outcomes examined could be interpreted as inconclusive at best, and generally not significant (Table 12).

In terms of licensure passage, it appears that the rates are uniformly high and therefore should not be of much concern. In addition, there does not seem to be any distinct pattern to passage rates by program length. Given the widely varying (and often very small) number of students taking the exams, the passage rates, expressed in percentage terms, could be as much a function of the number of people taking the test as they are of program length.

III. ISSUES AND RECOMMENDATIONS

Associate in Arts Program Length

The minimum required to receive an Associate in Arts (A.A.) degree is 60 semester credit hours (SBE Rule 6A-14.030). The A.A., designed to be the transfer degree to the university system, must contain not less than 36 hours of general education course requirements (Section 240.239 (3) F.S.). Currently, only three community colleges award an A.A. degree at 60 SCHs. Eight colleges award the A.A. at 62 SCHs, 15 at 64 SCHS, one at 65 SCHS, and one at 67 SCHs. The 1994 Legislature directed the State Board of Community Colleges (SBCC) to amend its rules to require all community colleges to limit the A.A. degree to 60 SCHS. In addition, all of the credits must transfer to the State University System. To take effect, this requirement (contained in proviso language) must be reenacted by the 1995 Legislature or written into statute.

Semester credit hour expansion in the A.A. program has generally been within the area of general education requirements. At present there are no maximum SCHs prescribed in rule or statute for those courses. Consequently, general education requirements vary from a low of 36 to a high of 47 SCHs. To better prepare students, some colleges have designed a longer, more rigorous general education curriculum. Others require students to take a number of courses (computer information, ethics, physical education) that expand the A.A. degree and are not transferable to the SUS.

The amount of semester credit hours required to receive an A.A. has a fiscal impact on both the state and the student. Currently the SUS must award an A.A. transfer student a minimum of 60 credit hours, but universities can recognize in excess of this number when the credits are applicable to the program the student is entering (BOR Rule 6C-6.004 (2) (b)). However, universities rarely if ever award more than 60 SCHs to an A.A. transfer student regardless of the number of credits the student has attained at the community college level.

The following recommendations are designed to clarify the rules and law pertaining to requirements for the Associate in Arts (A.A.) degree and to prohibit the unnecessary expansion of that award. In addition, the Commission wants to stress that efforts to shorten the time required for a degree should not unduly restrict students who can benefit from taking coursework beyond the hours required for an associate degree.

Recommendations:

1. State Board of Education Rule 6A-14.030 (1) should be amended to require that the associate in arts (A.A.) degree be awarded upon satisfactory completion of a planned program of ~~at least~~ sixty (60) college credits, exclusive of courses not accepted in the State University System, after the demonstration of the attainment of predetermined and specified performance requirements.

2. State Board Education Rule 6A-10.024 (5) (a) should be amended to require that the A.A. degree be awarded upon satisfactory completion of ~~at least~~ sixty (60) semester hours of college credit exclusive of courses not accepted in the state university system, and including a general education core curriculum of ~~at least~~ thirty-six (36) semester hours of college credit in the liberal arts and sciences. Section 240.239 (3) should be amended similarly.

3. The Commission believes that limiting the number of student credit hours in associate degree programs should not prevent a student from choosing to take additional courses necessary for a bachelor's degree program or career preparation. *For example, a student enrolling in a community college may be placed into mathematics or science courses that are at a lower level than those identified as the first course in sequence identified for a specific major. To meet all prerequisites for enrolling in a university, the student may need to take additional hours of coursework which exceeds the requirements for the associate degree.*

Associate in Science Program Length

General Education Requirements

The Associate in Science Degree (A.S.) was initially designed as career oriented degree, geared specifically to the needs of local employers. Consequently, colleges were given a great deal of latitude in establishing program requirements. As a result, the same occupational program may now vary from college to college both in competencies and in length. Unlike the A.A. degree, the A.S. degree does not have a minimum (nor maximum) number of general education (GE) requirements established in state statute or rule. The Southern Association of Colleges and Schools (SACS) requires that A.S. programs contain at least 15 hours of general education requirements. But with A.S. programs varying from 60 to 120 SCHs, there is no standardization of general education requirements. Some programs contain the minimum number of GE hours, while others, particularly in the professional fields, have added additional coursework in communications, computers, or mathematics. Community colleges need the flexibility to design A.S. programs to meet local industry needs while offering each student the basic educational skills necessary to be proficient in any field and transfer, if desired, to the State University System.

Recommendation:

4. State Board of Education Rule 6A-14.030 (2) should be amended to require that the associate in science (A.S.) degree be awarded upon satisfactory completion of a planned program of not less than sixty (60) college credits which include 18 semester credit hours of general education requirements.

Program Length

Because of the length variation among and between A.S. programs, the Commission conducted a statistical analysis of fourteen representative programs to determine if there were significant relationships between program length and certain student outcomes (completion rates, related employment, continuing education, and wages). The effects on licensure were examined separately. The results of the statewide analysis on program length revealed that, in general, program length does not have a major effect on the four outcome variables examined (Table 2). A sizable majority of all relationships examined were not statistically significant. Statistically significant relationships were split rather evenly between positive and negative effects. The exception to this was the effect of program length on completion. In the overall analysis this relationship was significant in 64 percent of the cases. In seven of the 14 programs the effect of program length was positive, in two programs it was negative, and in five programs the effect was non-significant.

The effects of program length on Job Related Employment were positive significant for only two programs and negative significant for two. That is, in 64 percent of the cases, program length was not a significant predictor of related employment. The effects of program length on wages were positive significant for three programs and negative significant for one. Again, program length was significant in predicting the wages of only 33 percent of the cases. The effect of program length on continuing education was non-significant in all but three programs (21% of cases) where it had a negative significant impact. In otherwords, the longer those three programs, the less likelihood that a student would continue in further postsecondary education.

To determine if there were a regional variation in the outcomes analysis, i.e. to determine if program length was more significant in different parts of the state, colleges were divided into five separate planning regions and the same analysis was conducted holding region constant. The breakdown by region revealed that, for the most part, program length was non-significant and when the effect was significant it was more often negative. Once again, program completion was the only student outcome where length had a significant impact. Overall, program length had a non-significant effect on 78 percent of the cases (Table 9).

To determine the importance of geographic location on income, an average quarterly wage was calculated for all of the programs by region. As expected, average incomes in Region 5 (Dade, Broward, Monroe and Palm Beach Counties) were considerably higher than those in the other four regions (Table 11). To further determine the effects of region on wages, a regression analysis was conducted on the three programs that had registered a positive significant relationship between length and income. Region 5 served as a reference or comparison regions for the analysis. The results of the regression revealed that geographic location had a more significant effect on income than program length (Table 10).

Licensure passage rates were analyzed for the three largest programs that require students to be licensed. Passing rates are uniformly high and there does not seem to be any distinct pattern to passage rates by program length. Because of the varying number and often small number of students taking an exam, it appear that the passage rates could be as much a function of the number of testers as they are of program length (Charts 1,2,3).

In summary, the Commission's statistical analysis did not support the conclusion that program length had a significant affect on the student outcomes identified. It would appear that other factors (such as geographic location) are more likely the predictors of student outcomes. The hypothesis that a longer program is beneficial to the student because it may contain more opportunities for training or learning is not supported by the present data. However, additional data collections over the next few years will increase the number of students enrolled in the programs, and non-significant differences may change in some cases. Until further evidence is compiled it would appear that unless there is a specific rationale for additional requirements, the SBCC should use the minimum number of hours presently required by the colleges for each program in establishing program length standards.

Recommendations:

5. The State Board of Community Colleges should establish in rule a standard program

length for each associate in science program. The number of required credit hours should not exceed the minimum number of hours necessary to prepare the student for job entry.

6. The process of reviewing compliance with the A.S. program length standards should become part of the Community College Accountability Plan. Thus, Section 240.324 (1) F.S. should be amended to include (g) Length of time and number of academic credits required to complete an Associate of Science degree by institution and by degree.

To implement this requirement, the State Board of Community Colleges and the Florida Education and Training Placement Program (FETPIP) should work together to compile and analyze three years (1992-95) of student outcome data to further determine the effects of A.S. program length on selected student outcomes.

IV. CONCLUSION

This study addresses what has become a national concern of time to degree completion: the increased coursework needed to complete degree programs at both the associate and baccalaureate level. What was once considered the norm for an associate degree program (60 semester credit hours) is now the exception. The same is true of the once common 120 semester credit hour baccalaureate degree. Currently, only three community colleges in Florida award an Associate of Arts (A.A.) degree after a student has attained 60 semester credit hours (SCHs). Associate in Science (A.S.) degrees range from 60 to 117 SCHs. Of the 612 baccalaureate degree programs offered by the State University System, only 19 are currently awarded after 120 SCHs at **every** institution where they are offered. It is clear that the time required to earn a degree has a fiscal impact on both the state and student.

The intent of the state's articulation agreement was to allow students transferring to the SUS with an A.A. degree to immediately begin to take junior and senior level coursework. The Commission received testimony that some transfer students are required to take additional lower level courses at the university because particular college courses do not meet university level criteria. These determinations should not be made after a student receives an A.A. and transfers to a university. The leveling of coursework should be determined by the articulation committee and by faculty articulation committees on a annual basis.

Currently the SUS must award an A.A. transfer student a minimum of 60 credit hours, however, there is little evidence that universities award in excess of those hours regardless of the number of courses that a student has completed. Consequently, it does not appear in the student's best interest for any community college to expand the A.A. degree beyond 60 SCHs. At the same time, students enrolled in A.S. degree programs should expect to receive their education/training at the minimum number of hours necessary to obtain successful entry level employment. While this study focused on community college program length, parallel attention to SUS degree programs is warranted. It does not appear that the vast majority of baccalaureate programs in the public sector should require students to complete more than 120 SCHs. In addition, a review of the baccalaureate curricula to ensure that half of all required coursework is offered at the lower level in order to reinforce the state's 2 + 2 articulation is justified.

Appendix A

CHARTS AND TABLES

TABLE 1

SELECTED COMMUNITY COLLEGE A.S. PROGRAMS

Range of Hours	Average	Program	Basis for Selection (See Key)
(60 - 81 SCH)	64.53	Air Conditioning, Refrigeration and Heating Systems Technology	4
(60 - 85 SCH)	65.14	Aircraft and Piloting and Navigator	4
(74 - 90 SCH)	82.33	Cardiovascular Technology	2
(63 - 78 SCH)	73.52	Computer Engineering Tech	2,4
(60 - 88 SCH)	69.86	Court Reporting Tech	4
(84 - 98 SCH)	89.22	Dental Hygiene	5
(60 - 75 SCH)	69.33	Electronics Engineering Tech	4
(61 - 82 SCH)	72.40	Emergency Medical Tech	4
(60 - 74 SCH)	65.81	Legal Assistant	2,4
(74 - 95 SCH)	87.42	Nuclear Medicine Tech	3
(64 - 97 SCH)	75.25	Nursing	1,2,4
(67 - 101 SCH)	86.50	Photographic Tech	4
(64 - 98 SCH)	79.43	Radiography (Radiation Therapy)	1,2,4
(67 - 98 SCH)	83.29	Respiratory Therapy	2,4

1 - Limited Access
2 - Top Careers in Florida (as designated by the Florida Chamber of Congress)
3 - + 72 hours at all community colleges where offered.
4 - Wide range SCHS
5 - All the above

SOURCE: STATE BOARD OF COMMUNITY COLLEGES

Compiled by Postsecondary Education Planning Commission.

TABLE 2
RELATIONSHIP OF COMMUNITY COLLEGE
PROGRAM LENGTH TO SELECTED OUTCOMES
1991-92

Program	Completion	Related Employment[1]	Continuing Education[1]	Income[2]
AC Tech	Positive*	NS**	NS	NS
Cardio Tech	NS	NS	NS	NS
Comp. Tech	Positive	NS	NS	NS
Court Rep.	NS	(a)	NS	(a)
Dental Hyg.	Positive	NS	NS	NS
Electronics	Negative*	Positive	NS	Positive
Emerg. Med.	Positive	Negative	Negative	Negative
Legal Asst.	Negative	Positive	NS	Positive
Nuclear Med.	NS	NS	NS	NS
Nursing	NS	NS	Negative	Positive
Photo Tech	Positive	NS	NS	(a)
Prof. Pilot	Positive	NS	NS	NS
Radiography	Positive	Negative	Negative	NS
Resp. Care	NS	NS	NS	NS
Totals				
NS	5 (36%)	9 (64%)	11 (79%)	8 (67%)
Pos. Sig.	7 (50%)	2 (14%)	0 (0%)	3 (25%)
Neg. Sig.	2 (14%)	2 (14%)	3 (21%)	1 (8%)

TABLE 2 CONTINUED

GRAND TOTALS

Effects Estimated	Non-Significant	Positive Sig.	Negative Sig.
53	33 (62%)	12 (23%)	8 (15%)

[1]Program completers only.

[2]Employed completers only.

*An entry of "Positive" or "Negative" indicates a statistically significant relationship at the .05 level for all tables.

**An entry of "NS" indicates a non-significant relationship for all tables.

(a) The cross-tabulation contained more than one empty cell and therefore statistics could not be estimated.

Source: Florida Education and Training Placement Information Program

Compiled by: Postsecondary Education Planning Commission

TABLE 3
EFFECTS OF COMMUNITY COLLEGE
PROGRAM LENGTH ON COMPLETION *
1991-92

Program	Effect	% of Students in Below Average Length Completing	% of Students in Above Average Length Completing
AC Tech	Positive	36.4	70.6
Cardio Tech	NS		
Computer Tech	Positive	8.3	22.3
Court Reporting	NS		
Dental Hygiene	Positive	61.9	76.0
Electronics Tech	Negative	24.7	16.0
Emergency Med	Positive	32.3	52.9
Legal Assisting	Negative	26.1	20.5
Nuclear Med	NS		
Nursing	NS		
Photo Tech	Positive	20.4	52.1
Professional Pilot	Positive	13.3	33.6
Radiography	Positive	21.1	50.2
Respiratory Care	NS		

* For programs above or below mean.

Source: **Florida Education and Trainigng Placement Information Program**

Compiled by: Postsecondary Education Planning Commission

TABLE 4
EFFECTS OF COMMUNITY COLLEGE PROGRAM LENGTH ON RELATED EMPLOYMENT[1]
1991-92

Program	Effect	% of Students in Below Average Length Working in Related Field	% of Students in Above Average Length Working in Related Field
AC Tech	NS		
Cardio Tech	NS		
Computer Tech	NS		
Court Reporting	(a)		
Dental Hygiene	NS		
Electronics Tech	Positive	22.6	41.8
Emergency Med	Negative	80.0	50.0
Legal Assisting	Positive	32.4	42.7
Nuclear Med	NS		
Nursing	NS		
Photo Tech	NS		
Professional Pilot	NS		
Radiography	Negative	88.1	70.4
Respiratory Care	NS		

[1] Program completers only

(a) The cross-tabulation contained more than one empty cell and therefore statistics could not be calculated.

Source: **Florida Education and Training and Placement Information Program**
Compiled by: **Postsecondary Education Planning Commission**

TABLE 5
EFFECTS OF COMMUNITY COLLEGE
PROGRAM LENGTH ON CONTINUING EDUCATION[1]
1991-92

Program	Effect	% of Students in Below Average Length Continuing	% of Students in Above Average Length Continuing
AC Tech	NS		
Cardio Tech	NS		
Computer Tech	NS		
Court Reporting	NS		
Dental Hygiene	NS		
Electronics Tech	NS		
Emergency Med	Negative	70.0	35.1
Legal Assisting	NS		
Nuclear Med	NS		
Nursing	Negative	15.3	11.9
Photo Tech	NS		
Professional Pilot	NS		
Radiography	Negative	28.4	10.2
Respiratory Care	NS		

[1]Program completers only

Source: Florida Education and Training Placement Information Program

Compiled by: Postsecondary Education Planning Commission

TABLE 6
EFFECTS OF COMMUNITY COLLEGE PROGRAM LENGTH ON INCOME[1]
1991-92

Program	Effect	% of Students in Below Average Length Earning Above Avg. $	% of Students in Above Average Length Earning Above Avg. $
AC Tech	NS		
Cardio Tech	NS		
Computer Tech	NS		
Court Reporting	(a)		
Dental Hygiene	NS		
Electronics Tech	Positive	17.5	51.1
Emergency Med	Negative	81.8	39.3
Legal Assisting	Positive	13.4	27.5
Nuclear Med	NS		
Nursing	Positive	62.6	69.3
Photo Tech	(a)		
Professional Pilot	NS		
Radiography	NS		
Respiratory Care	NS		

[1]Employed program completers only

(a) The cross-tabulation contained more than one empty cell and therefore statistics could not be estimated.

Source: Florida Education and Training Placement Information Program
Compiled by: Posecondary Education Planning Commission

TABLE 7
AVERAGE COMMUNITY COLLEGE
PROGRAM LENGTH BY REGION
1991-92

Program	Total	Region 1	Region 2	Region 3	Region 4	Region 5
AC Tech	65	NA	NA	62	NA	NA
Aircraft	65	NA	NA	NA	NA	75
Cardio	82	NA	NA	NA	NA	NA
Comput	74	NA	73	66	75	NA
Court Rpt	70	NA	NA	NA	NA	68
Dental	89	85	90	NA	NA	94
Elect Eng	69	66	69	70	72	71
Em Med	72	NA	72	66	75	70
Legal Ast	66	61	64	63	67	69
Nuclear	87	NA	NA	NA	NA	NA
Nursing	75	72	74	73	74	83
Photog	87	NA	NA	NA	NA	NA
Radiog	79	NA	92	75	NA	78
Resp	83	77	98	77	76	82

* Not enough programs were in the region to justify computing an average.

Source: Florida Education and Training Placement Information Program

Compiled by: Posecondary Education Planning Commission

TABLE 8

COMMUNITY COLLEGES BY REGION

Region I	Region IV
Chipola	Edison
Gulf Coast	Hillsborough
North Florida	Manatee
Okaloosa-Walton	Pasco-Hernando
Pensacola	St. Petersburg
Tallahassee	South Florida
Region II	**Region V**
Central Florida	Broward
Daytona	Florida Keys
FCCJ	Miami-Dade
Lake City	Palm Beach
St. John's	
Sante Fe	
Region III	
Indian River	
Lake-Sumter	
Polk	
Seminole	
Valencia	
Brevard	

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TABLE 9
SUMMARY OF EFFECTS OF COMMUNITY COLLEGE PROGRAM LENGTH BY REGION[1] (1991-92)

Program/ Region	Completion	Related Employment	Continuing Education	Income
AC Tech.				
3	NS	NS	NS	(a)
Comp. Tech				
2	Positive	NS	NS	(a)
3	(a)	(a)	(a)	(a)
4	Negative	NS	NS	NS
Court Rep.				
5	Negative	(a)	NS	(a)
Dental Hyg.				
1	Negative	NS	NS	NS
2	Positive	NS	NS	Negative
5	NS	NS	NS	NS
Electronics				
1	NS	NS	NS	NS
2	NS	NS	NS	NS
3	NS	NS	Negative	NS
4	Negative	NS	NS	(a)
5	Negative	Positive	NS	NS
Emerg. Med				
2	NS	NS	NS	NS
3	(a)	(a)	(a)	(a)
4	(a)	Negative	NS	Negative
5	Negative	(a)	NS	NS
Legal Asst.				
1	Positive	NS	NS	NS
2	NS	NS	NS	NS
3	NS	NS	NS	NS
4	NS	NS	NS	NS
5	NS	NS	NS	Positive

TABLE 9
CONTINUED

Nursing	Completion	Related Employment	Continuing Education	Income
1	NS	NS	NS	NS
2	Negative	NS	NS	NS
3	Positive	NS	Negative	Positive
4	Negative	Negative	NS	NS
5	NS	NS	NS	NS
Prof. Pilot				
5	Positive	NS	NS	NS
Radiography				
2	Negative	NS	(a)	NS
3	Positive	(a)	NS	NS
5	Positive	NS	NS	NS
Resp. Care				
1	Negative	NS	NS	NS
2	NS	NS	NS	Positive
3	NS	NS	NS	NS
4	NS	NS	Positive	NS
5	NS	NS	NS	NS
Totals				
NS	16 (48%)	28 (90%)	30 (91%)	25 (83%)
Pos. Sig.	7 (21%)	1 (3%)	1 (3%)	3 (10%)
Neg. Sig.	10 (30%)	2 (6%)	2 (6%)	2 (7%)

GRAND TOTALS OF EFFECTS BY REGION

Effects Estimated	Non-Significant	Pos. Significant	Neg. Significant
127	99 (78%)	12 (9%)	16 (13%)

[1]In many of the regions the effects of program length could not be estimated because there was no program in the region; or the program length variable either did not vary within the region or had too few cases to construct a cross-tabulation.

(a) The cross-tabulation contained more than one empty cell and therefore statistics could not be calculated.

TABLE 10: REGRESSION OF COMMUNITY COLLEGE PROGRAM LENGTH ON INCOME COMPARED WITH REGION 5 1991-92

Program	Length(1)	Region1(2)	Region 2(2)	Region 3(2)	Region 4(2)
Electronics	$7.90	- $2437.65	- $2077.87	- $395.18	- $358.52
Legal Asst.	$55.56	* -$1356.64	- $761.32	*- $1750.52 *	- $1549.32
Nursing	$9.18	* -$1241.49 *	- $857.50 *	- $750.77 *	- $1123.43

Notes: * significant at the .05 level.

(1) A statistically significant regression coefficient for Length would be interpreted "for every credit hour increase in program length, an increase of x dollars in Income is predicted." However, for the three programs above, length is not a statistically significant predictor of income with program length and region as predictor variables.

(2) A statistically significant regression coefficient for Region is interpreted "students in this region earn x amount less than students in Region 5."

R^2 for each program was < .10 That is, less than 10% of income variation is attributable to the combined effects of program length and region.

TABLE 11 AVERAGE INCOMES BY REGION[1]

Total	Region 1	Region 2	Region 3	Region 4	Region 5
$7,471	$6,831	$7,260	$7,446	$7,090	$8,339

[1]Only employed program completers were included in calculations of average incomes.

Source: Florida Education and Training Placement Information Program

Compiled by: Postsecondary Education Planning Commission

TABLE 12

COMBINED TOTAL OVERALL EFFECTS AND EFFECTS BY REGION OF COMMUNITY COLLEGE PROGRAM LENGTH

Effects Estimated	Non-Significant	Pos. Significant	Neg. Significant
180	132 (73%)	24 (13%)	24 (13%)

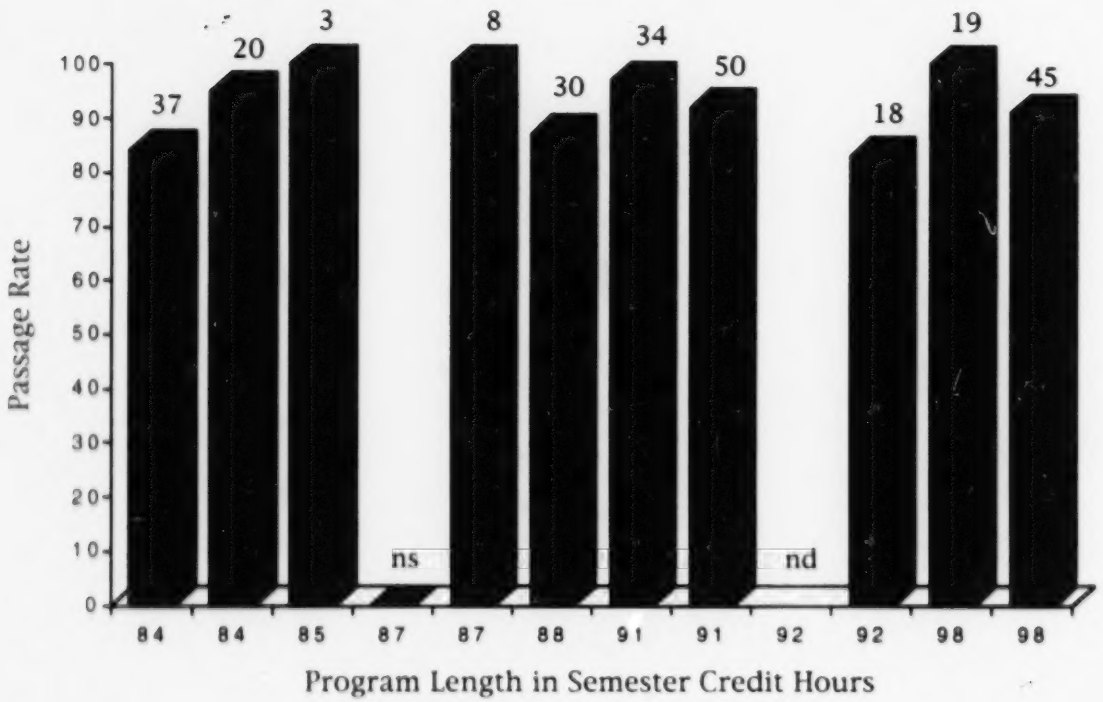
Source: Florida Education and Training Placement Information Program

Compiled by: Postsecondary Education Planning Commission

CHART 1

DENTAL HYGIENE LICENSURE PASSAGE BY PROGRAM LENGTH[1]

1991-92



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[1] Entries on top of bars represent number of people who took the exam.

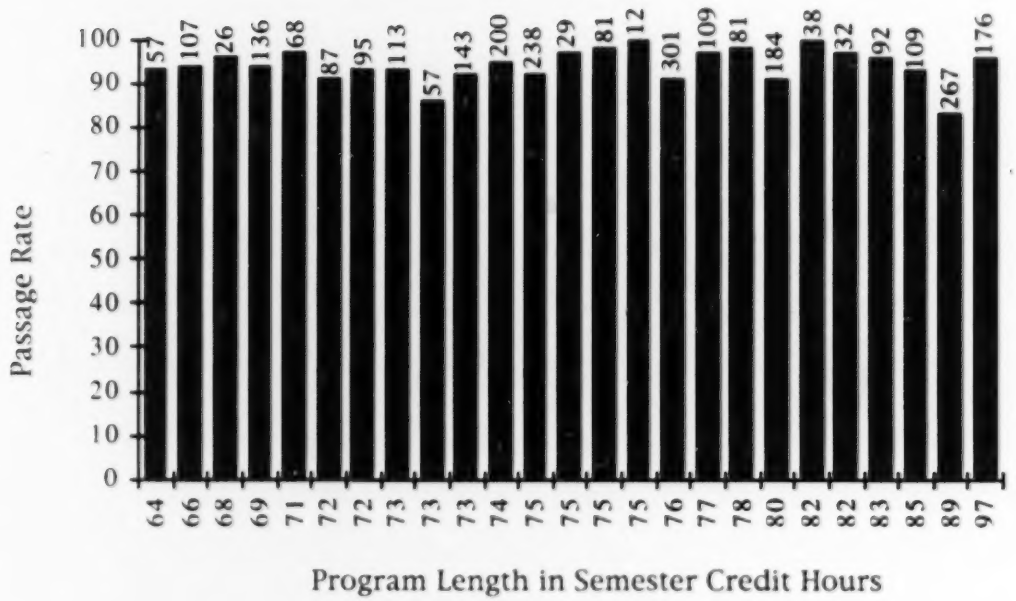
ns = No students took the exam.
nd = No data reported.

Source: Department of Professional Regulation
Compiled by: Postsecondary Education Planning Commission

CHART 2

NURSING LICENSURE PASSAGE BY PROGRAM LENGTH[1]

1991-92



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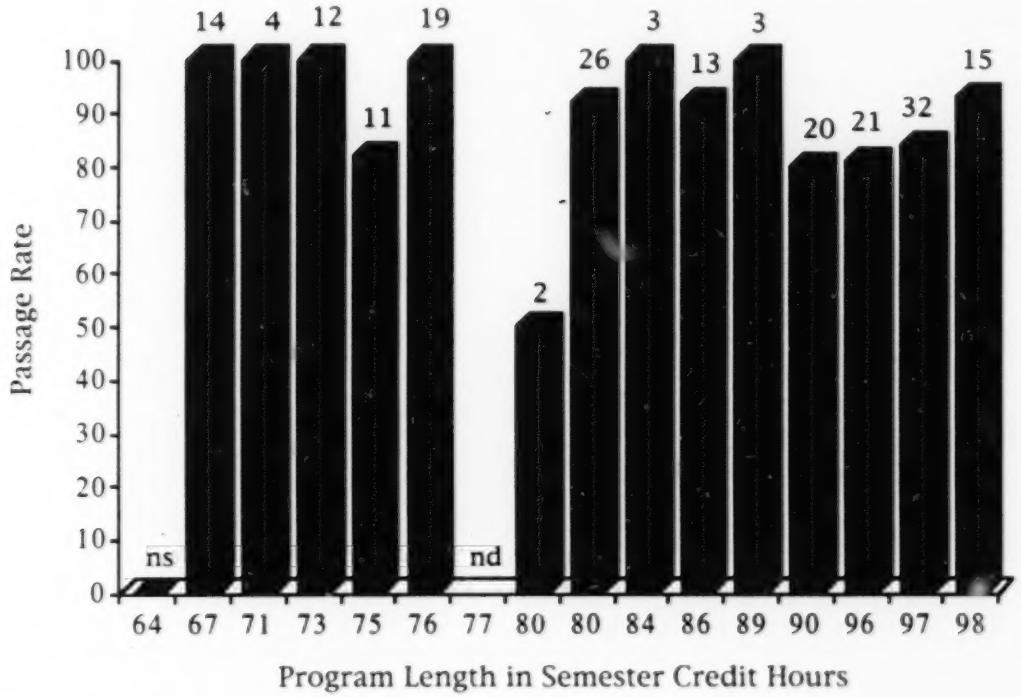
[1] Entries on top of bars represent number of people who took the exam.

Source: Florida State Board of Nursing
Compiled by: Postsecondary Education Planning Commission

CHART 3

RESPIRATORY THERAPY LICENSURE PASSAGE BY PROGRAM LENGTH[1]
1991-92



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[1] Entries on top of bars represent number of people who took the exam.

ns = No students took the exam.
nd = No data reported.

Source: Department of Professional Regulation
Compiled by: Postsecondary Education Planning Commission

Appendix B

CONSULTANT'S REPORT

Methods of Analysis

The Chi-Square Test

All analyses were conducted using the chi-square test of statistical significance on cross-tabulations (crosstabs). A cross-tabulation is a joint frequency table of the two variables being analyzed. For example in a crosstab of the variables program length and program completion, the cell in the first row and first column of the table would contain the number of students in programs of below average length who did not complete their program. The first row, second column would contain the number of students in below-average length programs who did complete their program, and the second row of the table would contain the corresponding numbers of students in above-average length programs who did and did not complete.

The chi-square test of significance is the standard statistical test used with crosstabs to determine if there is a relationship between the two variables. The statistic is calculated by comparing the cell frequencies that would be expected if there were no relationship between the variables to the frequencies actually observed. The larger the difference between the expected and observed frequencies, the larger the chi-square statistic, with larger chi-square values indicating a significant relationship. A statistically significant relationship implies that there is less than a five percent chance that the frequencies observed in the crosstab would occur by chance if there were no relationship between the variables.

This method was chosen for two reasons. First, it is the simplest type of analysis that can be used for the type of data analyzed and the relationships of interest. Second, this method allows a relatively easy

interpretation of the results because the crosstab provides the number and percent of students in each cell of the table. Thus, if program length is determined to have a significant effect on a given program outcome the percentages can be compared to determine the actual amount of difference program length makes.

To construct the crosstabs, the program length variable was grouped into two categories, above average and below average, where the average was the mean program length for each program, and for each program within each region for the regional analyses. This was necessary to insure that a sufficient number of cases were included in each category of this variable to construct crosstabs. Many of the smaller programs had very few cases for any given program length, and this problem was exacerbated when only program completers (and only employed completers in the case of the income analysis) were used, as well as when the programs were disaggregated by region.

Since income is a continuous variable, it was also necessary to group it into above and below average categories in order to construct easily interpretable crosstabs and compare percentages. Average incomes were calculated as the mean total wages for program completers who were employed, and for the regional analysis employed program completers within each region to control for possible regional differences in income levels.

Two caveats are in order for interpreting the results presented here. First, the chi-square statistic is rather sensitive to sample size, meaning that as sample size increases the value of the chi-square increases. Thus, it is possible that with a very large sample size one could obtain a statistically significant result with very small differences in

percentages. Therefore, especially for the larger programs, it is prudent to examine the percentages provided as well as the statistical significance of the relationship to insure that the difference observed is substantively important.

Second, in many of the regional analyses there were a rather small number of cases involved, especially when only completers and employed completers were included. This makes the crosstabs difficult to interpret because the addition (or subtraction) of only one or a few cases can change the results dramatically. This also makes the calculation of percentages less meaningful. Therefore, the regional results should be considered somewhat tenuous, and more weight should be placed on the overall analyses, which included larger numbers of cases.

Regression

A regression analysis was conducted to determine the effects of program length and region on income for the three programs in which the chi-square analysis had shown a positive significant relationship between income and program length. The regression procedure plots the data points in space, then estimates the linear equation that best fits those points. For the Program Length variable, regression coefficients (if statistically significant) are interpreted as the amount of change one would expect in income for a one unit increase in program length. The Region variables are dummy variables, which means they are either coded as 0 or 1. For example, the variable region 1 would be coded as 1 for those cases from region 1 and 0 for cases from all other regions. Region 5 serves as a reference or comparison region. The coefficients for these

variables, if significant, are interpreted as the amount that incomes in a given region differ from incomes in region 5, the comparison region.

Interpretation of Results

It does not appear that program length has a major effect on any of the four outcome variables examined. A sizable majority of all relationships examined were not statistically significant, and those that were seem to be split rather evenly between positive and negative effects. The only possible exception to this would be the effect of program length on completion. In the overall analysis this relationship was positive and significant for seven of the 14 programs examined, compared to five non-significant effects and only two significant negative effects, indicating that longer programs would increase the probability of completion. However, in the regional analysis more relationships were non-significant than either positive or negative, and there were actually more negative effects than positive. Thus, it would appear that these results are inconclusive. However, keeping in mind that more weight should be given to the overall analysis, it may be that program length does in fact have a positive impact on completion.

The results of the regression analyses do not appear to show much of an effect of program length on income. The largest program, Nursing, had a very small and non-significant effect of program length and significant effects for all four region variables. In general, the weight of evidence supports the conclusion that program length does not have an effect on income.

In terms on licensure passage, it appears that the rates are uniformly high, and therefore should not be much of a concern. In addition, there does not seem to be any distinct pattern to passage rates by program length. Given the widely varying (and often very small) numbers of students taking the exams, it seems that the passage rates, expressed in percentage terms, could be as much a function of the number of people taking the test as they are of program length.

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